3.2.9. DATA PROCESSING

Solar radiation data are currently being monitored by STAR at 11 sites: the four CMDL baseline observatories (BRW, MLO, SMO and SPO); three BSRN sites (BAO, Bermuda, and Kwajalein); two UV monitoring sites (Nome and St. Paul, both in Alaska); Kosan, Korea; and CMDL's headquarters at the DSRC in Boulder. Thermal (IR) radiation is also monitored at all these sites with the exception of St. Paul and Nome.

Five meteorological data streams (wind speed, wind direction, pressure, temperature, and relative humidity) are monitored by the STAR group at the BSRN sites. Pressure, temperature, and relative humidity are monitored at Kosan. Temperature measurements are made at BRW to be used in conjunction with a new IR sensor, and pressure is measured for use with sunphotometer data at SPO.

Sunphotometers have been installed at BRW, MLO, SPO, BAO, Kwajalein, Boulder, and Kosan. Data from the sunphotometers, as well as the meteorological and radiation data, are collected by Campbell Scientific data loggers. Windowed, cavity radiometers are operating at two sites (BAO and Boulder). Data from these instruments are collected by custom programs and stored locally on a PC. Multi-filter rotating shadowband radiometers (MFRSRs) continue to operate at Bermuda, Kosan, and at Boulder. MFRSR data are collected and stored locally on a PC. UV data are monitored at BRW, in addition to Nome and St. Paul. BSI instruments are used to collect the UV data and store the data onsite on a PC.

The MLO Automated Solar Dome data are collected by a custom program on a PC running at that site. Also at MLO, data are monitored on a precision filter radiometer (PFR), which is a tracking sunphotometer used for optical depth measurements. The PFR data are collected by a Campbell Scientific data logger. All-sky images are made with Yankee Environmental Systems (YES) Total Sky Imagers at three sites (BAO, BRW, and Boulder). These data are collected and processed by YES proprietary software. All data that are collected on the Campbell data loggers are transferred to CMDL over telephone lines, with the exception of data from SPO. Calls to the data loggers are made at regular intervals varying from 2 to 12 hours depending on the site being called. All other data are retrieved via the Internet. Some of the Internet connections are, however, made over telephone lines.

Each morning all data from all sites are permanently stored on one of the CMDL servers in Boulder. The data are then loaded into archive files. All archive files for all projects have exactly the same format. Uniformity among the archive files has simplified data access. Plots and lists of the data are available to CMDL scientists from the archive files. Modifications can be made at field sites after data review.

Currently the solar and thermal radiation, meteorology, and sunphotometer data are being edited using qualitative and quantitative methods. CMDL is a contributing member of the BSRN network. The radiation and meteorology data are sent to the BSRN database in Zurich, Switzerland. Access to the data for people outside CMDL is available from BSRN, or from CMDL directly upon request.